state of the air was deplorably bad, and the planet was low at the time of the immersion. The light of the satellite gradually faded, until it was much less than that of *Dione* (then near its eastern elongation), and at last could only be certainly seen during the brief periods of more tranquil vision. The last of these occurred at about $12^h 30^m$ G.M.T.; and at the next tolerable view, which occurred at $12^h 33^m$, the satellite had totally disappeared.

Had the planet been near the meridian, and the air in a good state, I believe the observation might have been made with a considerable degree of certainty. It may be hoped that the excellent opportunities which have lately occurred of observing the Saturnian phenomena in America will not have been neglected.

I am not acquainted with any other observation of an eclipse of this satellite; and it is the first which I have been able to see, though constantly on the watch for it near the times of the disappearance of the ring in 1848, and in the present year.

On June 2, the shadow of *Titan* again transited the disk of *Saturn*. The sky was most unfavourable; yet a tolerable view of the planet, at about $8^h 50^m$ G.M.T., showed the shadow notching the eastern edge; and at $8^h 55^m$ the shadow had completed its ingress. When it had advanced some way on the disk, I carefully estimated that it projected about as much from the *south* side of the ring, as seen on the planet, as on May 17 it projected from the *north* side of it. Highest useful power, 296. Before the shadow arrived at the middle of its transit, clouds completely covered the sky.

The comparison of the times of ingress, on May 17 and June 2, gives the synodic period $=15^d{\cdot}97500$, being about $1^m 40^s$ greater than the calculated period.

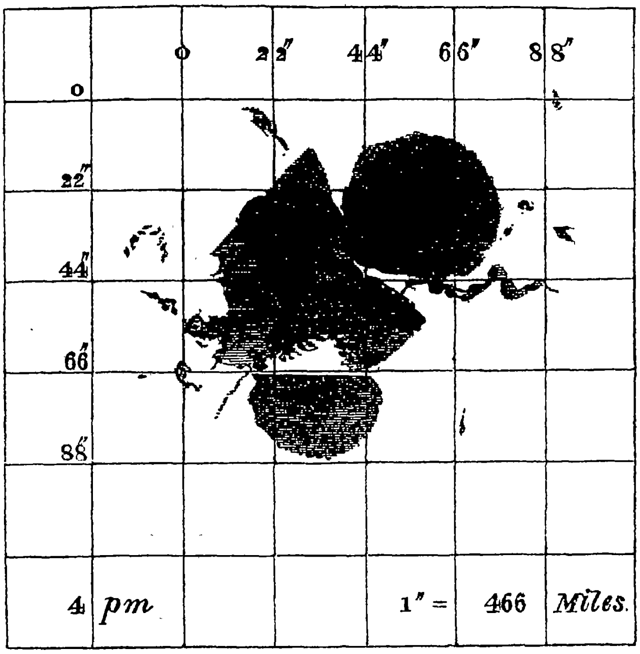
Hopefield Observatory, Haddenham, Thame,
1862, *June* 10.

June 11. The eclipse of *Titan*, last night, was lost through clouds.

On a Solar Spot. By R. Hodgson, Esq.

The large group of spots which has passed across the Sun's disk during the last fortnight was so peculiar in its formation that upon the 8th inst. I made a micrometrical drawing of it. When it first appeared on the Sun's limb, it was a series of circular and nucleated spots, not quite in contact with each other; as it approached the centre of the Sun, they spread out

until nearly in contact; a day or two after, on the 7th, one of the circular spots appeared to be cut in half and obliterated, having a sharp defined edge; on the 8th, a second circle was similarly cut to a straight line, the other half coalescing with a



spot near it; on the 11th I saw it again for a few minutes, when the whole group was much more detached, and, with the exception of the largest spot, the circular character had entirely passed away.

Telescope, 6 inches aperture. Power, 120.

At the close of the evening meeting Mr. Carrington explained and illustrated by diagrams the process which he had lately made use of in obtaining the corrections required by his provisionally assumed elements of position of the solar equator. He stated that 86 series of observations alone were found suitable out of about 1000, which his records comprise, it being necessary to reject the greater part on account of the mutual action of one spot on another in its neighbourhood, and to use only isolated nuclei of small extent and regular form. He showed how the required corrections were deducible from the quantities X and Y, found from an equation corresponding to each observation of the form,

$$\delta' - \delta = \mathrm{X} \cos \alpha - \mathrm{Y} \sin \alpha,$$

in which δ' is N.P.D., found by use of the provisional elements, δ the true N.P.D., and α the heliographical longitude of the

spots, reckoned along the solar equator from the ascending node. The values of the elements which he has found from the 86 series are

$$I = 7° 15' \quad \text{and } N = 73° 40' \text{ for } 1850{\cdot}0,$$

the values of M. Laugier, deduced about 1841, from 26 series, being,

$$I = 7° 9' \quad \text{and } N = 75° 8' \text{ for } 1840,$$

and those of Dr. Böhm from 19 series being

$$I = 6° 57' \quad \text{and } N = 76° 46' \text{ for } 1877,$$

The rotation per diem was exhibited in a tabular form for every 5 degrees of declination, as deduced directly from numerous singly determined values in each parallel. The formula

$$865' - 165' \sin^{\frac{7}{4}} \text{lat.}$$

satisfies the whole so nearly, that although it can only temporarily be regarded as an empirical result waiting for theoretical explanation, it is difficult to see how any improvement in it can be effected as a representation of the numbers. Mr. Carrington claims the term in latitude of the solar rotation as one of the chief results of his long-continued observations of the Sun, the whole of which are nearly ready for the press. It would be anticipating the intended future publication to give more than the bare results in the present place.

In reference to the remarks made in the *Monthly Notices* for February 1862, pages 124 and 125, Mr. Pogson, writing through the Astronomer Royal, desires to make it known that he has undertaken to extend Professor Argelander's noble work southward, by a complete Celestial Survey of the Southern Heavens, as soon as the Variable Star Atlas shall be out of hand. This Survey must, in the first instance, be limited, in its southern direction, by the southern horizon of Madras; but Mr. Pogson looks hopefully to the possibility of ultimately completing it by an expedition to Australia.

Mr. Pogson hopes to begin this work early in 1863; but, he remarks, the limits of time and money, as defined by Professor Argelander's experience, will not apply to a similar work undertaken in an exhausting tropical climate with native assistants.

G. B. Airy.

1862, *June* 17.